

What is claimed is:

1. A method for increasing the susceptibility of a cell to DNA-damaging agents, comprising introducing into the cell an antisense oligonucleotide that specifically hybridizes to a nucleic acid encoding a DNA dependent protein kinase subunit so as to prevent expression of the DNA dependent protein kinase subunit; wherein the antisense oligonucleotide is in an amount sufficient to increase the sensitivity of the cell to heat, chemical, or radiation-induced DNA damage; and wherein the DNA dependent protein kinase subunit is a DNA dependent protein kinase catalytic subunit, a Ku70, or a Ku80.
2. The method of claim 1, wherein the antisense oligonucleotide is enclosed in a liposome prior to introduction into the cell.
3. A method of treating a tumor in a subject, comprising administering to the subject an antisense oligonucleotide that specifically hybridizes to a nucleic acid encoding a DNA dependent protein kinase subunit so as to prevent expression of the DNA dependent protein kinase subunit; wherein the antisense oligonucleotide is in an amount sufficient to increase the sensitivity of the tumor to heat, chemical or radiation-induced DNA damage; and wherein the DNA dependent protein kinase subunit is a DNA dependent protein kinase catalytic subunit, a Ku70, or a Ku80.
4. The method of claim 3, wherein the antisense oligonucleotide is enclosed in a liposome prior to being administered to the subject.

5. The method of claim 3, wherein the administering to the subject an antisense oligonucleotide comprises: administering to the subject an expression vector for the antisense oligonucleotide; and inducing the expression of the antisense oligonucleotide.
5
6. The method of claim 3, further comprising administering to the subject one or more DNA-damaging agents.
- 10 7. The method of claim 6, wherein the DNA-damaging agents are adriamycin, bleomycin, or etoposide.
8. The method of claim 6, wherein the DNA-damaging agents induce double strand breaks.
9. A method for treating cancer in a subject, comprising: introducing into the subject an expression vector comprising a heat shock promoter and an antisense oligonucleotide that specifically hybridizes to a nucleic acid encoding a DNA dependent protein kinase subunit so as to prevent expression of the DNA dependent protein kinase subunit; and inducing expression of the antisense oligonucleotide, wherein the antisense oligonucleotide is in an amount sufficient to increase the sensitivity of the cell to heat, chemical, or radiation-induced DNA damage; and wherein the DNA dependent protein kinase subunit is a DNA dependent protein kinase catalytic subunit, a Ku70, or a Ku80.
15
20
25
10. The method of claim 9, wherein the antisense oligonucleotide is introduced selectively at sites of cancer.
30

11. The method of claim 9, further comprising directing heat, radiation, or chemotherapy at sites of cancer.
- 5 12. The method of claim 9, further comprising applying electric field energy to sites of cancer.
13. The method of claim 12, wherein the electric field energy comprises radiofrequency radiation.
- 10 14. The method of claim 9, further comprising implanting a reservoir of chemotherapeutic agents near sites of cancer, wherein the chemotherapeutic agents are releasable over a period of time of at least eight hours.
- 15 15. An antisense oligonucleotide that specifically hybridizes to a nucleic acid encoding a DNA dependent protein kinase subunit, wherein the DNA dependent protein kinase subunit is a DNA dependent protein kinase catalytic subunit, Ku70, or Ku80, so as to prevent expression of the DNA dependent protein kinase subunit.
- 20 16. The antisense oligonucleotide of claim 15 linked to a substance which inactivates mRNA.
17. The antisense oligonucleotide of claim 16, wherein the substance which inactivates mRNA is a ribozyme.
- 25 18. The antisense oligonucleotide of claim 15 linked to a regulatory element.
19. The antisense oligonucleotide of claim 18, wherein the regulatory element is an inducible

promoter.

20. The antisense oligonucleotide of claim 18, wherein the regulatory element is a heat shock promoter.
- 5 21. An expression vector adapted for the expression of the antisense oligonucleotide of claim 15.
22. An expression vector adapted for the expression of the antisense oligonucleotide of claim 16, 17, 18, 19, or 20.
- 10 23. A pharmaceutical composition comprising the antisense oligonucleotide of claim 15 and a carrier.
24. A pharmaceutical composition comprising the antisense oligonucleotide of claim 16, 17, 18, 19, or 20 and a carrier.
- 15 25. The pharmaceutical composition of claim 23, wherein the carrier is adapted for passage through a plasma cell membrane.
- 20 26. The pharmaceutical composition of claim 24, wherein the carrier is adapted for passage through a plasma cell membrane.